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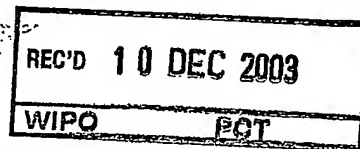
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Specification and Drawings, as originally filed, with Application for Patent Serial No:  
2,406,320, on October 2, 2002, by CHRISTOPHER C. SYKES, for "Height Adjustable Desk".

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## ABSTRACT OF THE DISCLOSURE

Provided is a desk assembly comprising a base adapted to stably engage a floor surface. An upright support member is secured to and extends upwardly from the base. A planar desk is connected in slidable engagement to the support member between a lower and an upper position. Biasing means, preferably a gas spring, is connected between the base and the desk. The biasing means biases the desk upwardly from said lower position toward said upper position. Locking means is operable to selectively secure said desk intermediate said lower and upper positions. The provision of the upwardly biased force, preferably a gas spring, between the upper and lower positions, improves convenience for the user when adjusting height of the desk.

## HEIGHT ADJUSTABLE DESK

### FIELD OF THE INVENTION

This invention relates to a height adjustable desk and more particularly to a height adjustable desk which utilizes an upwardly biased force to provide lift to the desk.

### BACKGROUND OF THE INVENTION

It is known to provide desks or work stations which allow the user to adjust the height thereof. This height adjustment allows for differences in the heights of the users or to adjust the height of the work surface depending on the task at hand. Known height adjustment of desks and work stations is achieved in various manners. Often, to adjust the height of the desk, significant time and effort is involved. For example, rudimentary systems involve manually adjusting the length of each of the legs of the desk. Other height adjustment systems have the desk attached to a base support via a telescoping support member or members which may be secured at various vertical positions. Such systems require the user to manually expand or retract the telescoping support member and then fix it in place at the desired height. The weight of the desk and/or the weight of the items positioned on the surface thereof make this height adjustment somewhat cumbersome as it may be difficult to simultaneously lock the desk in place and resist the gravitational forces acting on the desk. Certain other height adjustment mechanisms are complex and expensive to

manufacture. It is desirable to provide an improved and more efficient and inexpensive height adjustable desk.

**SUMMARY OF THE INVENTION:**

It is an object of the invention to provide an improved height adjustable desk.

In accordance with an aspect of the invention there is provided a desk assembly comprising a base adapted to stably engage a floor surface. An upright support member is secured to and extends upwardly from the base. A planar desk is connected in slidable engagement to the support member between a lower and an upper position. Biasing means is connected between the base and the desk. The biasing means biases the desk upwardly from said lower position toward said upper position. Locking means is operable to selectively secure said desk intermediate said lower and upper positions.

The provision of the upwardly biased force, preferably in the form of a gas spring between the upper and lower positions, improves convenience for the user when adjusting height of the desk.

**BRIEF DESCRIPTION OF THE DRAWINGS:**

FIG. 1 is a lower perspective view of a preferred embodiment of the desk assembly in accordance with the invention;

FIG. 2 is an upper perspective view of a preferred embodiment of the desk assembly in accordance with the invention;

FIG. 3 is a perspective view of a portion of the desk assembly in accordance with the invention;

FIG. 4 is an exploded view of the desk assembly of FIG. 3; and

FIG. 5 is a sectional view taken along line A-A of FIG. 3.

**DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS:**

Shown in Figures 1 to 5 is a preferred embodiment of the desk assembly in accordance with the invention. The desk assembly 10 has a front F and a rear R.

A base 12 is preferably an approximately isosceles trapezoidal shape with a concavely curved inner side, and may be comprised of steel and is adapted to stably engage a floor surface. An upright support member, preferably an extruded aluminum column 14 defining a hollow interior space 16, and having a vertical wall 18 is secured to the base and extends upwardly there from. The wall has inner 20 and outer 22 vertical surfaces. The column may include a removable cap 21 which may be press fitted into engagement with the top of the column.

Preferably the column 14 is secured to the base by means of screws (not shown) extending through the base and into screw bosses 24 in the column 14 and the column 14 is positioned adjacent a rear edge portion 26 of the base.

Support means, preferably forwardly and diagonally extending brackets 28, secured to a carrier plate 30 are connected in slidable engagement along the column 14 between lower L and upper U positions. Preferably the brackets have upper planar outwardly extending horizontal flanges 32 upon which planar desk top 34 may be attached. The desk has a rearwardly positioned groove 33 in which the column 14 may be positioned. Although, it is preferred that a planar desk 34 is supported by the brackets 28, it should be understood that any suitable work piece may be supported by the brackets.

In the preferred form, the range of movement of the desk top permitted by movement of the support means between L and U includes or at least corresponds to positions of the desk top 34 employed by users of normal height when in seated and in standing positions, respectively.

A sliding channel piece 36 defines a vertical channel 38, having a lower end closed by an end piece 36a, is positioned along the inner vertical surface 20, and secured to the carrier plate 30 by a connector screw 42. Preferably, the sliding channel piece is guided along said inner vertical surface 20 by means of guide ribs 41 formed integrally with the inner vertical surface 20 of the extruded column 14. The connector screw 42 connects the carrier plate 30 and channel piece 36 so that the two move vertically in unison between the upper U and lower L positions. The connector screw extends rearwardly through a hole 44 in said carrier plate, through a vertically extending slot 46 machined in the column vertical wall 18 and in threaded engagement with nut 48 welded to the inner face of the channel piece in alignment with a hole 49 formed through the channel piece 36. Vertical travel is limited at the lower position L by the connector screw 42 contacting the bottom of the slot 46 and at the upper

position U by locking screw 43 contacting the top of the slot 46.

Preferably a wheel assembly 50 is rotatably mounted on each side of the carrier plate 30. Each wheel assembly 50 is secured to the carrier plate 30 by means of an axle assembly 52 which extends through rearwardly extending side portions 54 of the carrier plate on each side of the carrier thereof. Each portion 54 extends within a forwardly opening vertically extending channel 56 formed integrally with the vertical wall 18 of the extruded column 14. Preferably the brackets 28 are secured to the side portions 54 on each side of carrier plate 30 and the portions 54 and brackets as well as channels 56 extend at an acute angle with respect to one another and with respect to a vertical plane of symmetry 55. Each wheel assembly 50 comprises a pair of wheel members 60 rotatably engaged on said axle assembly 52. The wheels are normally in rolling engagement with the column wall outer surface within channel 56.

A locking device is provided, preferably in the form of a clamp operable from adjacent the desk top 34, to selectively secure the support means in positions intermediate said upper U and lower L positions. Preferably locking screw 43 extends through the carrier plate 30 and sliding channel piece 36 via screw bosses formed therein, and is threadably engaged within a tapped hole 70A in a clamp plate 70 which is positioned adjacent said sliding channel piece 36 rearward of said channel piece within the column. Preferably, the clamp plate 70 comprises a main portion 70B extending transversely of the plane 55 and two outwardly rearwardly including wing portions 70C each engaging and extending parallel to the inner surfaces 20 of the portions of the bases of the forwardly opening vertically extending channels 56. The locking screw 43 has an enlarged head 43a abutting the front face of the

carrier plate 30 which prevents the screw from advancing through the carrier plate. The locking screw may be rotated to threadably engage the clamp plate 70. With the head 43a flush with the carrier plate 30, threadably engaging the clamp plate 70 with the locking screw head 43a deforms the carrier plate 30 resiliently into engagement with the vertical wall outer surface 22 and the resulting tension in the screw 43 presses the wings 70C of the clamp plate 70 tightly against the inner side of the bases of the channels 56. In this condition, the frictional engagement of plates 30 and 70 with the column 14 locks the support means 28 and 30 in a selected position in the range of movement between the upper U and lower L positions.

A rotatable locking rod 80 is supported by bracket 82, secured to and extending from the underside of said desk top 34 and has a forwardly positioned locking knob 84 for rotation of said rod about its axis. The locking rod 80 is fixed to, for example with a set screw (not shown) passing radially through the head 43a, the head 43a so that rotation of the locking knob 84 rotates said the locking screw and thus allows locking of the support means by threading the locking screw 43 into the clamp plate 70 as described above by rotation of the knob 84 in one sense or release of the clamp plate 70 and carrier plate 30 by rotation of the knob in an opposite sense. It should be understood that any suitable locking device may be utilized to lock the desk in positions intermediate the upper U and lower L positions. For example, other clamping devices, could be used to selectively secure the brackets, the carrier plate or the channel piece to the column. While the above arrangement provides infinite adjustment within the permitted range, it is contemplated that the support means could be secured to the column 14 by locking pins, dowels or the like that allow the support means to be fixed to the column at a number of discrete positions in the range.



A upwardly biasing means, which is preferably a gas spring 100 is positioned between and connected between the base and the desk, for providing upward force sufficient to lift said support means and desk from the lower L to upper U positions without application of upward force by the user. In particular, the gas spring 100 is preferably positioned within the column 14 below the sliding channel piece 36 and biases the latter upwardly. Preferably gas spring 100 includes an axially extending pin at each end. The lower pin is seated in an opening 112 in the base 12. At the upper end, the pin 100A is received in an opening 36b in the end piece 36a. Preferably the gas spring comprises a single-acting non lockable piston, that simply compresses the gas in the cylinder on pressing the desk top 34 down on movement from U to L, the reaction against the piston providing the upward force that lifts the desk top 34 unassisted from L to U. The gas spring may be for example a Suspa (TM) gas spring, such as the Suspa 41090 available from Suspa Incorporated of Grand Rapids, Michigan, U.S.A. It should be understood that the upward biasing force could be provided by other means such as a compression spring or the like positioned in a same manner or similar to the gas spring 100 shown in the drawings.

In an alternate embodiment of the invention, the brackets 28 may be integrally formed with the carrier plate 30.

A monitor support bracket 122 may be mounted to the extruded column 14 or desk 34 for holding a computer monitor 400. A vertical partition member 124 may be secured to the extruded column 14, positioned rearwardly of the column to provide a sound and sight barrier for the desk. A rail 300 acting as a foot rest for the user may be secured

to the base 12

As will be apparent to those skilled in the art in the light of the foregoing disclosure, many alterations and modifications are possible in the practice of this invention without departing from the spirit or scope thereof. Accordingly, the scope of the invention is to be construed in accordance with the substance defined by the following claims.

**CLAIMS:**

1. A desk assembly comprising:  
a base adapted to stably engage a floor surface;  
an upright support member secured to and extending upwardly from said base;  
a planar desk, connected in slidable engagement to said support member between a lower and an upper position;  
biasing means connected between said base and said desk and biasing the desk upwardly from said lower position toward said upper position; and  
locking means operable to selectively secure said desk intermediate said lower and upper positions.
2. A desk assembly as recited in claim 1 wherein said desk is connected to said support member by support means.
3. A desk assembly as recited in claim 1 where said biasing means is a gas spring.
4. A desk assembly as recited in claim 3 wherein said gas spring comprises a single acting piston acting in a cylinder of compressed gas.
5. A desk assembly as recited in claim 1 wherein said support member is an extruded column including a vertical wall, the wall having inner and outer vertical surfaces.

6. A desk assembly as recited in claim 3 wherein said support means comprises:  
forwardly laterally extending brackets, each bracket having an upper planar surface for supporting said desk;  
a carrier plate secured to said brackets, said carrier plate positioned on said outer vertical surface of the column in sliding engagement therewith;  
a sliding channel piece positioned along said inner vertical surface, secured to said carrier plate by a connector screw, said connector screw extending through a vertically extending slot in said column, the slot extending between said upper and lower positions, the sliding channel piece secured in sliding engagement, moving in unison with the carrier plate between said upper and lower positions along said slot, said gas spring positioned below the sliding channel piece engaging an end piece of said channel piece.
7. A desk assembly as recited in claim 6 wherein said brackets incline forwardly outwardly with respect to a median plane of the assembly.
8. A desk assembly as recited in claim 6 wherein the locking means comprises a clamp, operable to releasably secure said support means to said support member.
9. A desk assembly as recited in claim 8 wherein said clamp comprises a locking screw having a screw head abutting a front face of the carrier plate, the locking screw

extending through said carrier plate, said slot and said channel piece and is threadably engaged with a clamp plate, said clamp plate positioned adjacent said vertical wall inner surface, such that selectively threadably engaging said clamp plate engages said clamp plate in frictional engagement in a clamped position with the vertical wall to retain the channel piece and carrier plate in a fixed position between said upper and lower positions.

10. A desk assembly as recited in claim 9 wherein the locking means further comprises a locking rod, having a forwardly positioned locking knob for rotation of said rod about its axis, said locking rod, engaged with the locking screw, such that rotation of said locking knob rotates said locking screw to selectively engage said clamp plate in said clamped position.

11. A desk assembly as recited in claim 10, where said locking rod is supported rotatably by a bracket secured to and extending from an underside of said desk.

12. A desk assembly as recited in claim 5 where said carrier plate includes wheel arrangements rotatably mounted thereto, which engage in an outer surface of the column.

13. A desk assembly as recited in claim 11 wherein forwardly opening vertically extending channels are integrally formed with the vertical wall of the column on each

side of the carrier plate, each adapted for accepting one of said wheel arrangements in rolling engagement therewith.

14. A desk assembly as recited in claim 6 wherein each said bracket includes an outwardly extending horizontal flange upon which the desk may be attached.

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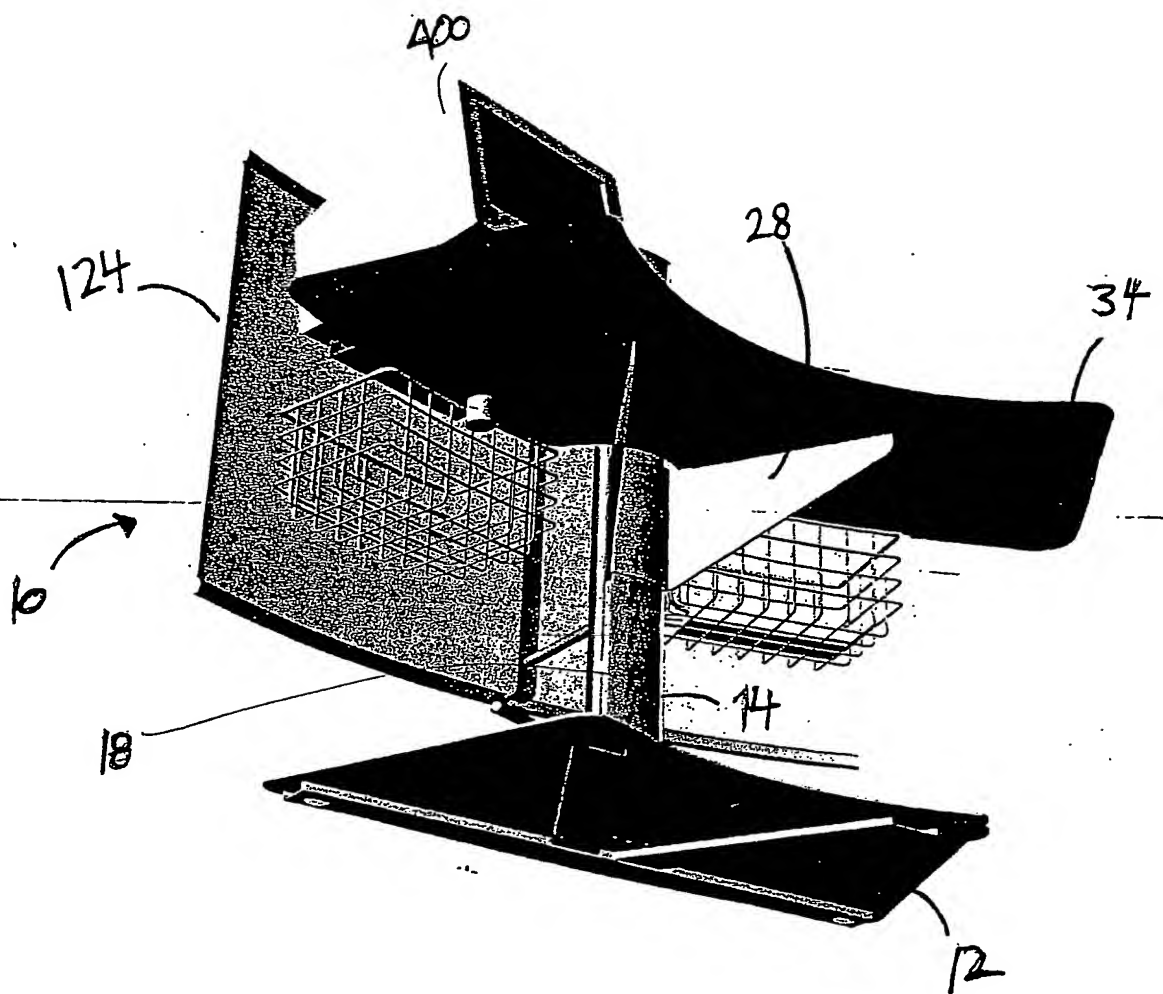


FIG 1

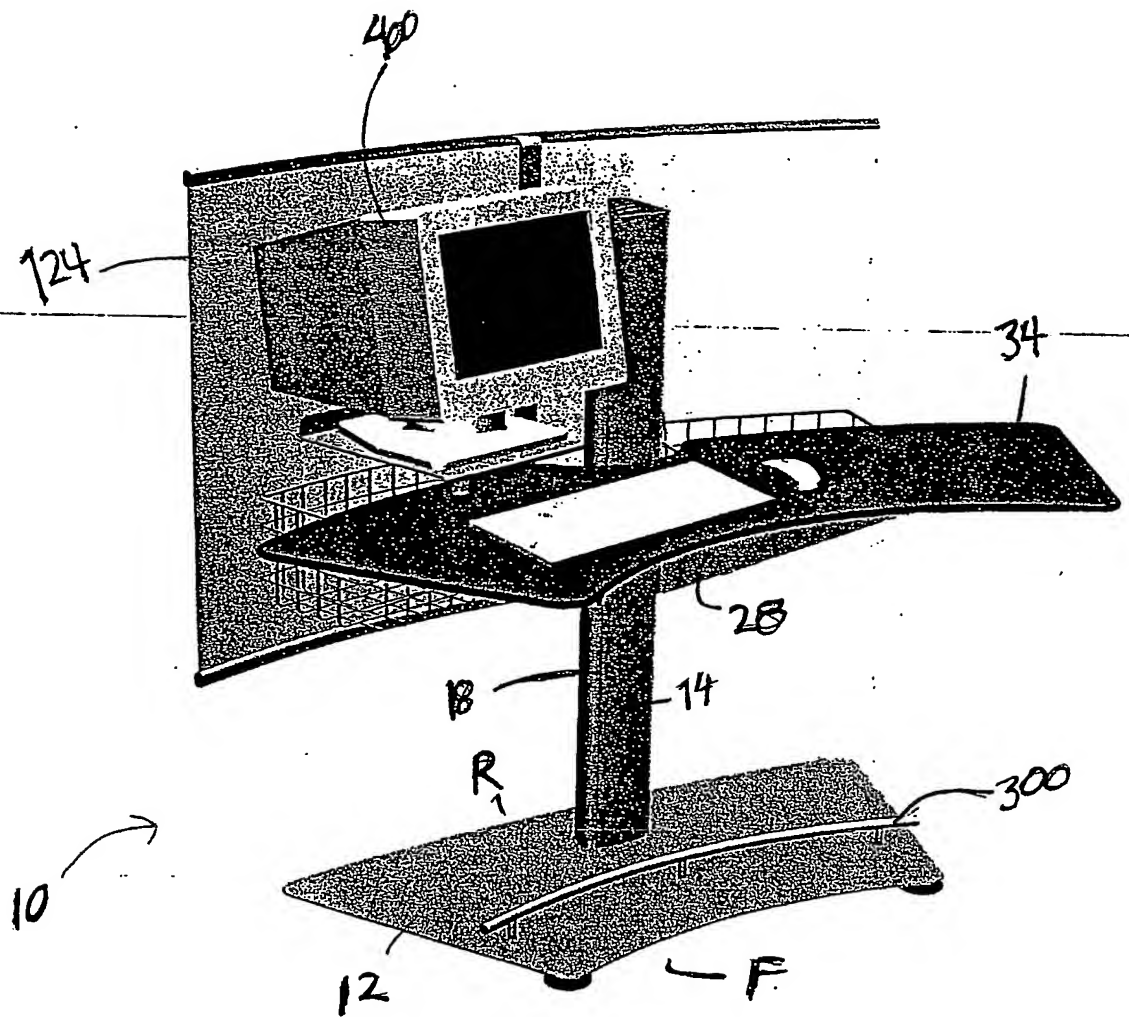
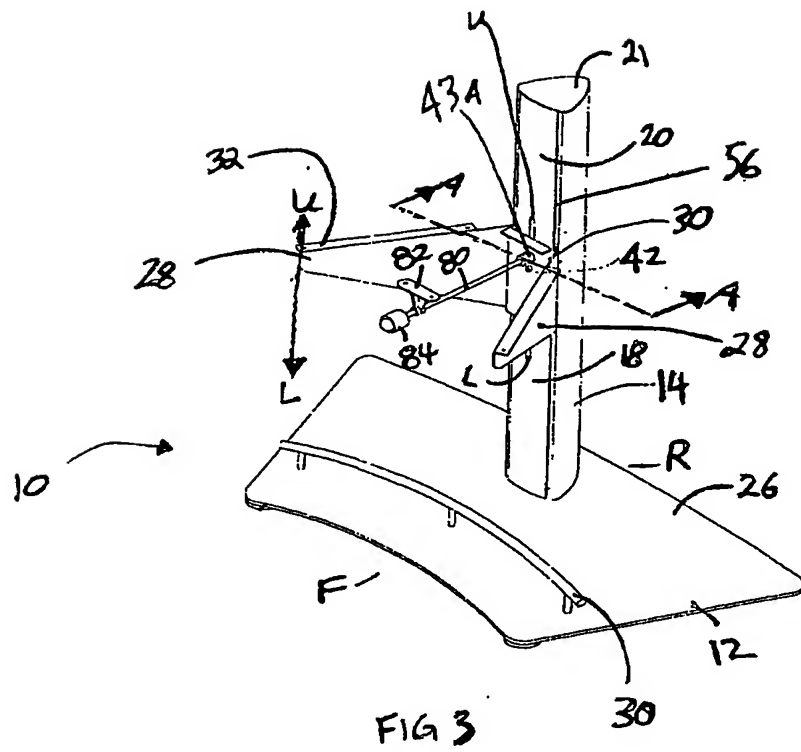


FIG 2







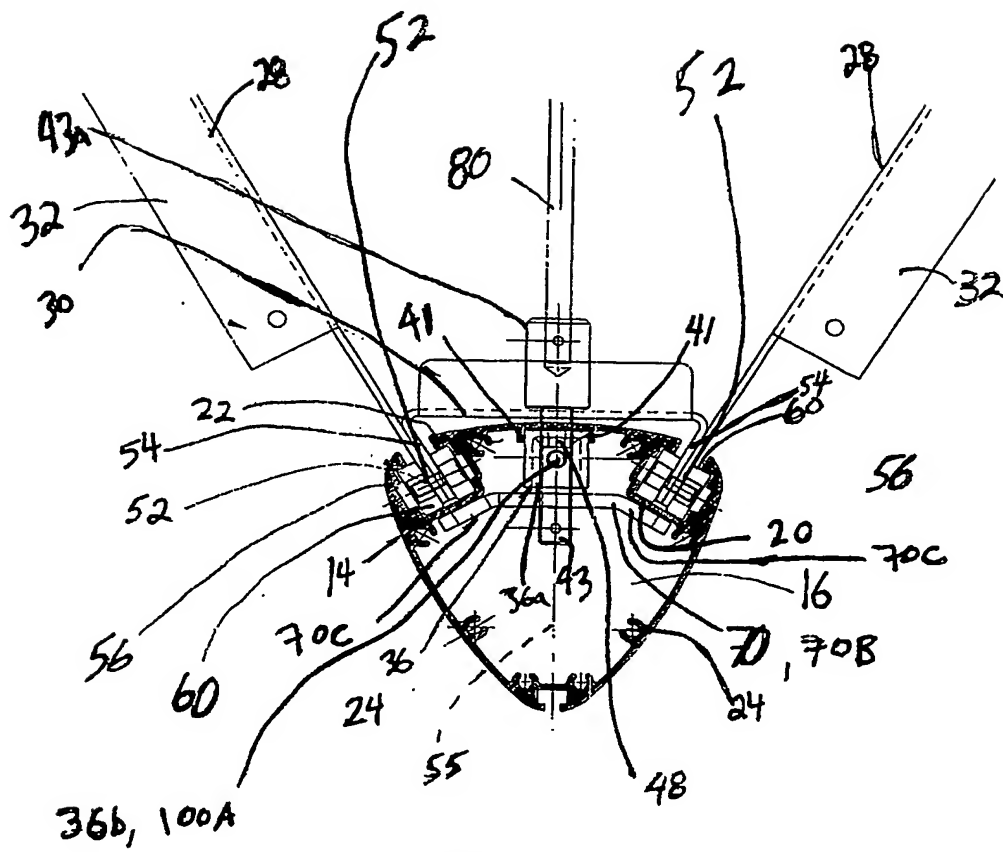


FIG. 5

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